

In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. – 21. (Canceled)

22. (Previously presented) A high quantum efficiency image sensor comprising:
a well region of a first conductivity in a substrate of a second conductivity opposite to
said first conductivity wherein said well region in said substrate forms a
photodiode; and
an isolation region of a first dielectric material within said substrate overlying edge
portions of said photodiode, having an opening in a center portion, the opening
exposing the well region;
wherein said isolation region comprises a stop layer, located at a bottom of the opening
and at a top of the isolation region; and
wherein a second dielectric material fills the opening.

23. (Original) The image sensor according to claim 22 wherein said well region is an N-well and said substrate is a P-substrate.

24. (Original) The image sensor according to claim 22 wherein said well region is a P-well and said substrate is an N-substrate.

25. (Original) The image sensor according to claim 22 wherein said isolation region is a shallow trench isolation.

26. (Original) The image sensor according to claim 22 wherein said stop layer comprises silicon nitride or silicon oxynitride.

27. (Original) The image sensor according to claim 22 wherein said stop layer has a thickness of between about 400 and 1000 Angstroms.

28. (Previously presented) The image sensor according to claim 22 wherein said first and second dielectric material comprises silicon oxide.

29. (Previously presented) The image sensor according to claim 22 wherein said second dielectric material has a thickness of between about 7000 and 13,000 Angstroms.

30. (Previously presented). The image sensor according to claim 22, wherein a refraction index of said stop layer is less than a refraction index of said well region and greater than a refraction index of said second dielectric material.

31. (Previously presented) A high quantum efficiency sensor comprising:
a well region of a first conductivity in a substrate of a second conductivity opposite to said first conductivity wherein said well region in said substrate forms a photodiode; and

an isolation region of a first dielectric material within said substrate overlying edge portions of said photodiode, having an opening in a center portion, the opening exposing the well region;

wherein:

said isolation region comprises a stop layer located at a bottom of the opening and a top of the isolation region;

a second dielectric material thereon filling the opening; and

the stop layer has a refraction index lower than a refraction index of the well region.

32. (Previously presented) The image sensor according to Claim 31 wherein the refraction index of the stop layer is higher than the refraction index of the first dielectric material of the isolation region.

33-37. (Canceled)